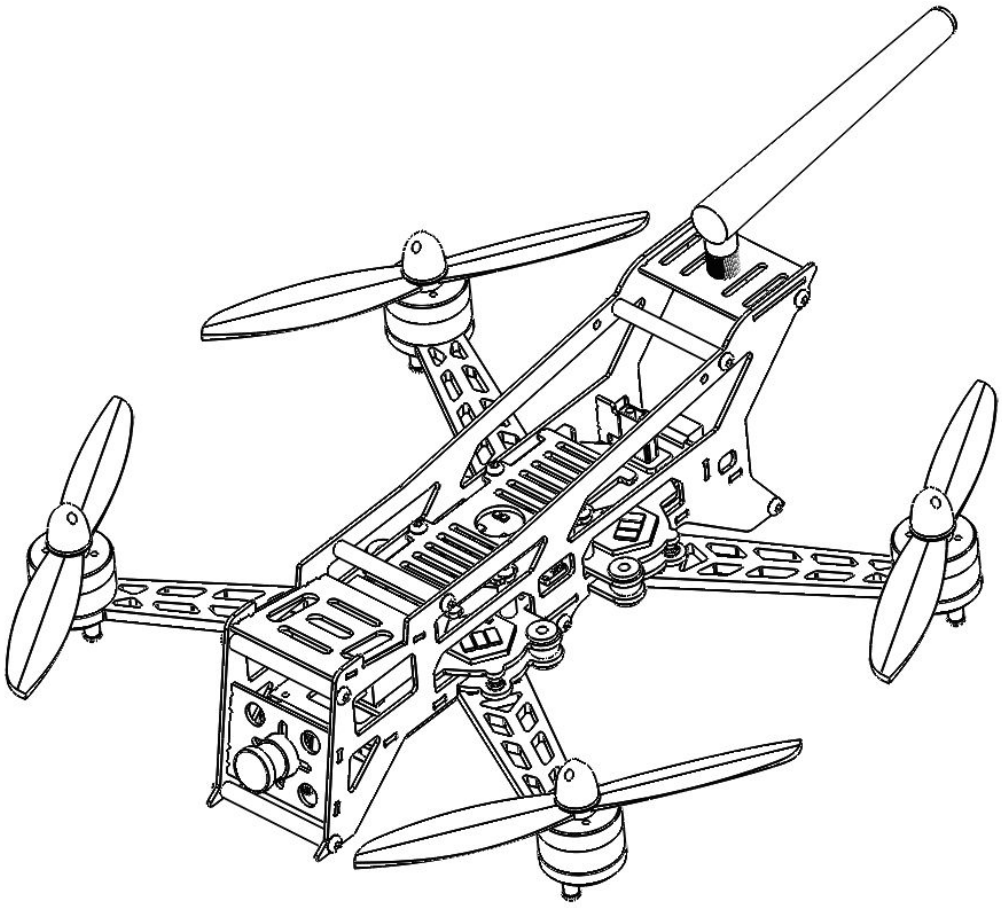
redpawz

Red Pawz CMR280 User Manual



The Red Pawz CMR280 comes configured for FPV Racing.

Configuration as follows:

1. A fully built and tested CMR280 frame made from CNC cut 3K carbon fiber.

2. Modular and removable 32-BIT. MultiWii flight control pre-programmed.

3. 4 x Red Pawz 2204-2300kv motor

4. 8 x 6030 nylon fiberglass propeller ,4 x CW ,4 x CCW (all black)

5. 4 x Red Pawz 12A ESCs with SimonK firmware

6. High integrated PCBA

7. Modular and removable 5.8G video transmitter and bulit-in Mini OSD

8. Dual antenna , 5.8G tail antenna and custom planel antenna

9. 4 x shock absorber rubber balls

10. 600TVL FPV camera

Optional spare parts:

1. 3D FPV Goggles + battery
2. Lipo: Gens ace 2200mah 3S 25C Lipo pack
3. RC TX/RX: The RTF frame does not come with a RC transmitter or RX. Any 2.4 Transmitter/RX or even LRS will work.
4. HD Camera：Mobius action-camera 1080P HD

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Disclaim

Thank you for choosing Red Pawz products.Many hours of development ,and testing time went into the CMR280 ,we truly hope that this is reflected in your experience with the product. Additional information can be found on our website at http://www.redpawz.com .Our products could be updated at any time,so please check frequently for software updates. If your have any questions, please leave us a message, our technical staff will reply in short time.

Before using our product, please read the product manual and strictly follow the instruction.This is race quad. It does not come with GPS, and it does require a fair amount of skill to pilot it .Quad props can do some serious damage when coming in contact with human.Unless you are ready to fly ,when you are working on a quad with the battery connected,it is highly recommended to remove all props. Any product damage cause by not doing so, Red Pawz will not be liable. If you find the product is damaged when you received it, please contact reseller first, they will replace or repair the product. Any user's modifications and disassembly, Red Pawz will not be liable .

The use of this product maybe prohibited in your country, please verify that the RF output power and frequencies used by this transmitter comply with local regulations . Do not fly recklessly ,do not fly near to airports , freeways, people and anywhere where an equipment failure or pilot mistake can cause injury or damage to people or property.

The Description of CMR280

Red Pawz CMR280, hereinafter referred to: "CMR280". The default configuration is designed for FPV racing . This is just a basic characteristics of the design, The greatest charm is offer a completely open source platform to the players, professionals and those who do not have enough equipment but wisdom enough.

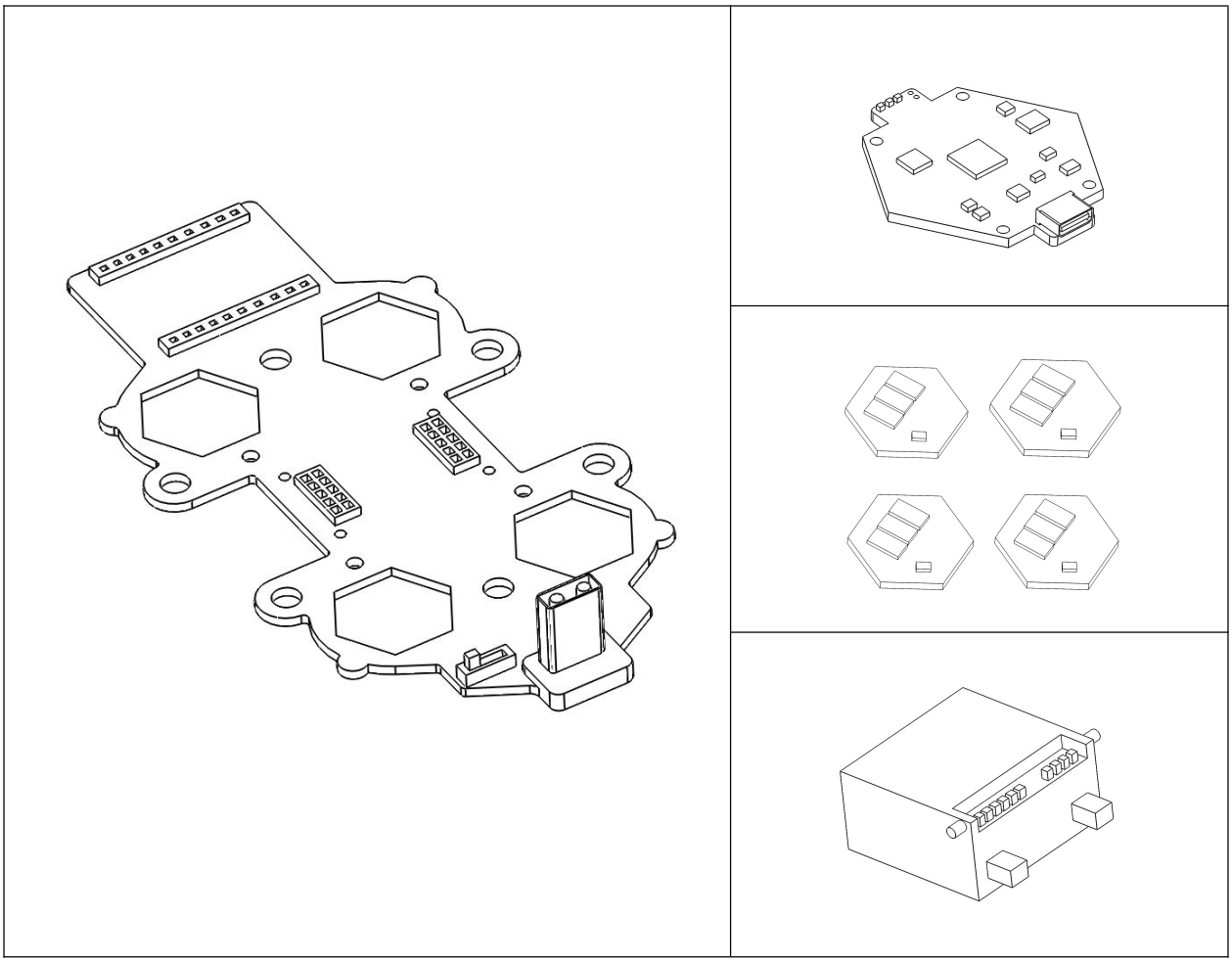
CNC(ed) 3K Carbon Fiber Frame

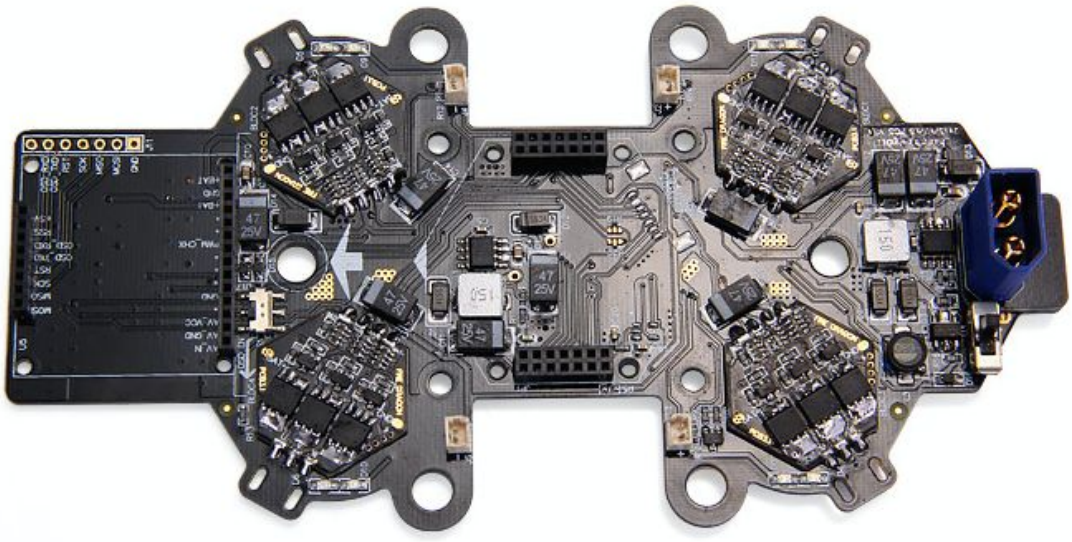
The modular design is easy and open to work on.If parts are damaged in a crash,the files are available for download to make new ones yourself,or you can buy parts from your local dealer.In addition to our 280 frame,a 250 and 300 size will be available in the near future .

All screw hardware is M3 for easy assembly.

Highly integrated independent PCBA

Highly integrated PCBA with modular ESCs and flight controller for convenient maintenance. This PCBA will be the heart of our future 250 and 300 quad also.





Flight Controller

The Flight control is optimized for Multiwii. It can be flashing to the latest MWC firmware, but you must be able to understand the program .If you want to take advantage of optimizing for the best flight experience.

R/C Transmitter Control Modes

Mode 1 - Europe

Mode 2 - USA

Mode 3

Mode 4

Flight Modes

Five flight modes are configured . The default mode is Horiz .

There modes are as follows:

ANGLE:

Stable mode if the PID values are correctly adjusted and the gyro and the accelerometers have been calibrated and trimmed.

According to MultiWii developers ANGLE MODE is virtually obsolete, HORIZON MODE is preferable in most cases.

Uses: gyro and accelerometers.

HORIZON :

A mixture between ACRO and ANGLE modes. Combining the stabilising effect with calm rc sticks and acrobatics with busy rc sticks.

ANGLE MODE mode when PITCH/ROLL sticks are centered. ACRO MODE mode when full PITCH or ROLL sticks are applied, allowing flips.

Uses: gyro and accelerometers.

BARO:

The barometer only is used, for the purpose of keeping a certain height. While there is an no other command from rc sticks.

Needs: gyro + acc + baro (acc is needed to estimate the Z acceleration in this mode)

You can activate BARO (ALT HOLD) and the GPS modes will use the same altitude.

MAG :

Heading lock mode. Can be activated in all flight stabilization methods.

The multi will continue to point in the same direction until there is a yaw input. Without this mode, you will still have a light deviation (like a tail gyro in heli).

compared to no MAG offers a drift free tail, just like the difference between heading hold and conventional helicopter gyros.

Needs: gyro + acc + mag sensors (acc is needed also because it is used in heading angle determination)

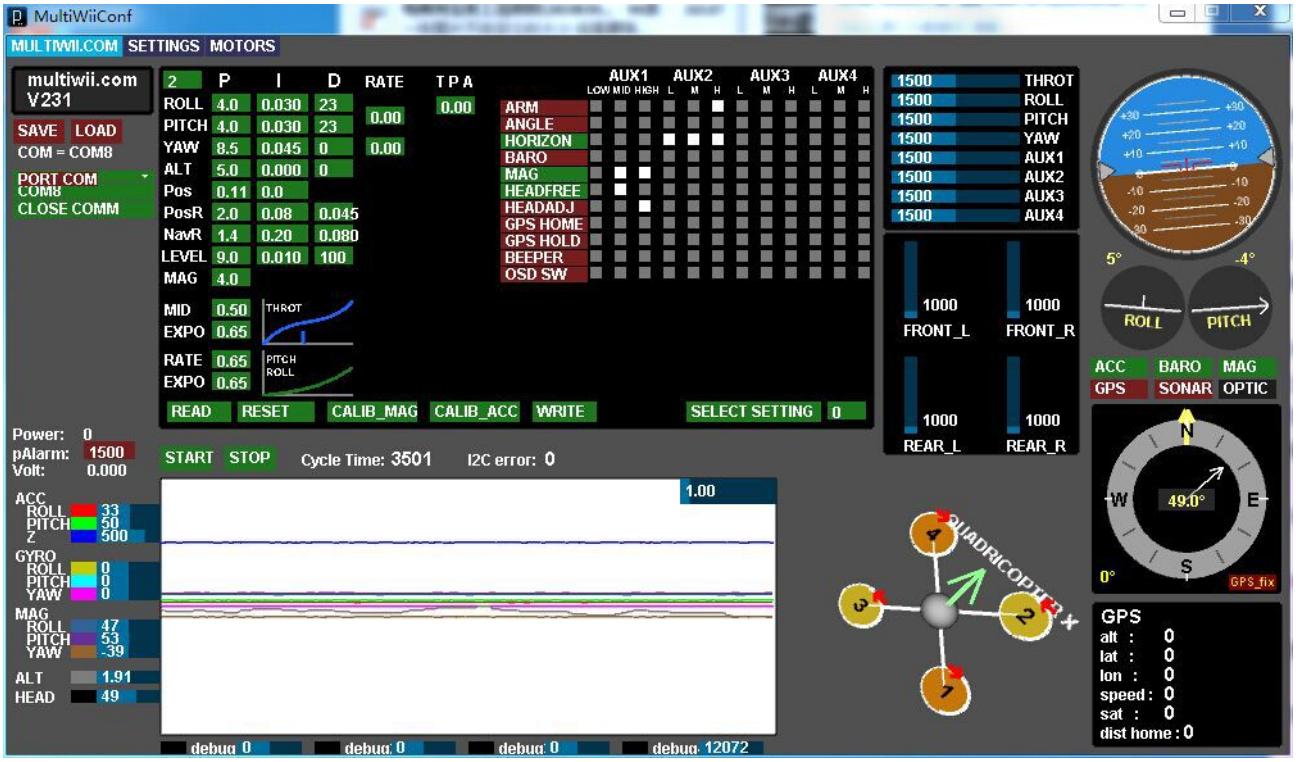
HEADFREE :

Does not impact the flight mode (ANGLE/HORIZON/ACRO). It only holds the orientation (yaw) of the multi and will always move in the same 2D direction for the same ROLL/PITCH stick movement. Can be activated with MAG mode

Holds the pilots 2D perspective as reference, MAG does not, both give a drift free tail.

Multiwii Configurator Connection

Hook up a computer via a standard Micro USB cable , to the connector on the side of CMR280 . Then open the MultiWii Configurator .



20A SimonK ESCs

1. What is “Firmware”?

Generally speaking, firmware is code program built into the micro controller unit (MCU) of electronic products. After the micro controller unit is powered up, the firmware will control MCU’s signals. Since the factory will download the firmware to the MCU’s Flash memory, many people call this process “Flashing”. In the RC model industry, products such as ESCs, receivers, digital servos, battery chargers and more need firmware in order to operate.

2. What is SimonK Firmware?

SimonK firmware is a firmware specifically for ESCs (electronic speed controllers) developed by Simon Kirby. This firmware has been found to offer faster response compared to normal ESC firmware, easy handling and good compatibility, all of which greatly enhances multirotor performance.SimonK firmware is continuously being optimized and upgraded. In the beginning, only ESCs which used an ATMEL micro controller could be upgraded, though now, the firmware can also be used on SiLabs and Intel 8051 MCUs. In addition, the firmware code is open, meaning you can modify the code yourself to better suit your ESC and/or application.

3. Why do I need to flash SimonK firmware?

A) Exploration. This is the common interest of RC model enthusiasts. If you want to know about the principles and hardware structure of the ESC, you can start by flashing SimonK firmware,which will allow you to learn the MCU download process.

B) Pursuit of changes. When you are tired of one ESC “personality”, you can update it by flashing SimonK firmware.

C) When troubles come out. When your ESC cannot power up your new motors, but your companions’ can. You need to implement SimonK firmware to your ESC. SimonK firmware has excellent compatibility. It can start almost every motor, except for damaged ones.

4. How to flash SimonK firmware?

Maybe you once downloaded firmware to the micro controller in your college laboratory. But that does not mean you can flash SimonK firmware into ESC’s MCU.

First, please ensure that your ESC support SimonK firmware. Second, pls meet following requirements.

A). Hex or Bin file. The firmware for the ESCs is available in a .hex or .bin file. One file contains the complete firmware for one ESC.

B). Interface Software (eg. AVR Studio) Depending on your platform you will need dedicated interface software installed on your computer to flash your ESC with the new firmware.

C). MCU programmer (eg. JTAG or USB ASP)

D). PIN -header or micro- clips to connect programmer to MCU Then you can flash the ESC with the video and other information on internet.

Note: You can flash your ESC multiple times but only the last flashed firmware is active on the micro controller. If the wrong firmware is flashed, you may end up with a damaged ESC when it's powered by the battery supply. It's important to safely test your ESC after the firmware upgrade.

5. How to get Pre-flashed ESCs with SimonK firmware?

Flashing your own ESCs is not so easy as you download music to your iPhones. It takes time, a flash tool and some research. For modelers who do not have any knowledge about MCU, the flashing process is difficult. Or some model flyers just need their models fly well and do not care about flashes. If you are in one of them, you can choose Red Pawz already flashed ESC.

6. Install your ESCs

We believe it is easy for you to install ESCs to multi-rotor platform. We still kindly remind you to make sure the correct and solid connection of each connector to silicon wire, battery wire to power distribution board, power distribution board to ESC, ESC to motor.

7. SimonK firmware ESC start-up tones

All ESCs make the motors sing, so does SimonK firmware ESC. When connected to power,you need firstly unlock the flight controller. Then ESCs make 3 beeps (di da di), to tell you self -detection finished. If flight controller also makes control instructions, a long beep (di----) will tell you ESCs have received throttle signal from flight controller and ready to start. Then pull up the throttle stick, motor starts to run. OK! Let's go!

8. How to do throttle calibration

Normally, you do not need to do throttle calibration for new multicopter ESCs. However, in some special cases, you still need to do it. Remove your props, and disconnect the battery. Push your radio throttle to maximum, connect the flight battery, wait for the 3 beeps(di da di), wait for 1s, you will hear a short beep(di). Then immediately lower the throttle to minimum. You will then hear another unique 2 beeps (di di), indicating you are setting the low value. If you hear a long beep, it means the low throttle set. Disconnect the battery, throttle calibration is done. If you hear a short beep, it means low throttle set failed. You need to do the calibration again. If still no success, pls contact us.

9. SimonK ESC breakdown

SimonK firmware ESC has big starting- up torque, if your flight controller algorithm is not reasonable or motor quality is not high, too much throttle increment will cause burst current too high to burn ESC. We all do not want it happen. To avoid it, we give you the following suggestions:

1), Choose low- heating ESCs for your Multicopter.

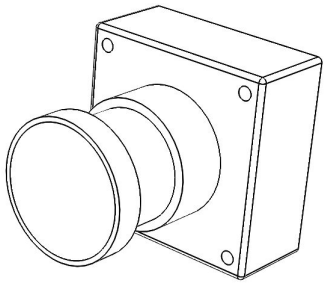
2), Choose ESCs continuous current higher than maximum current of the motor.

3), Ensure good heat -radiation of the ESC.

If your ESC damaged during flight, please contact us, we will solve the problem for you as soon as possible.

Camera

FPV Camera



The default FPV camera is 620TVL low lux CCD Camera.

Sensor Chip:1/3 inch HD Color CMOS

Video Standards: PAL

Effective Pixels: PAL=720(H)*576(V)

Definition: 600TV Lines(HD)

Lowest Lux: 0.01 Lux

Video Output: 1.0Vp-p/75Ω

Power consumption: 40MA ±10%

Operating Voltage: DC5-15V ±10%

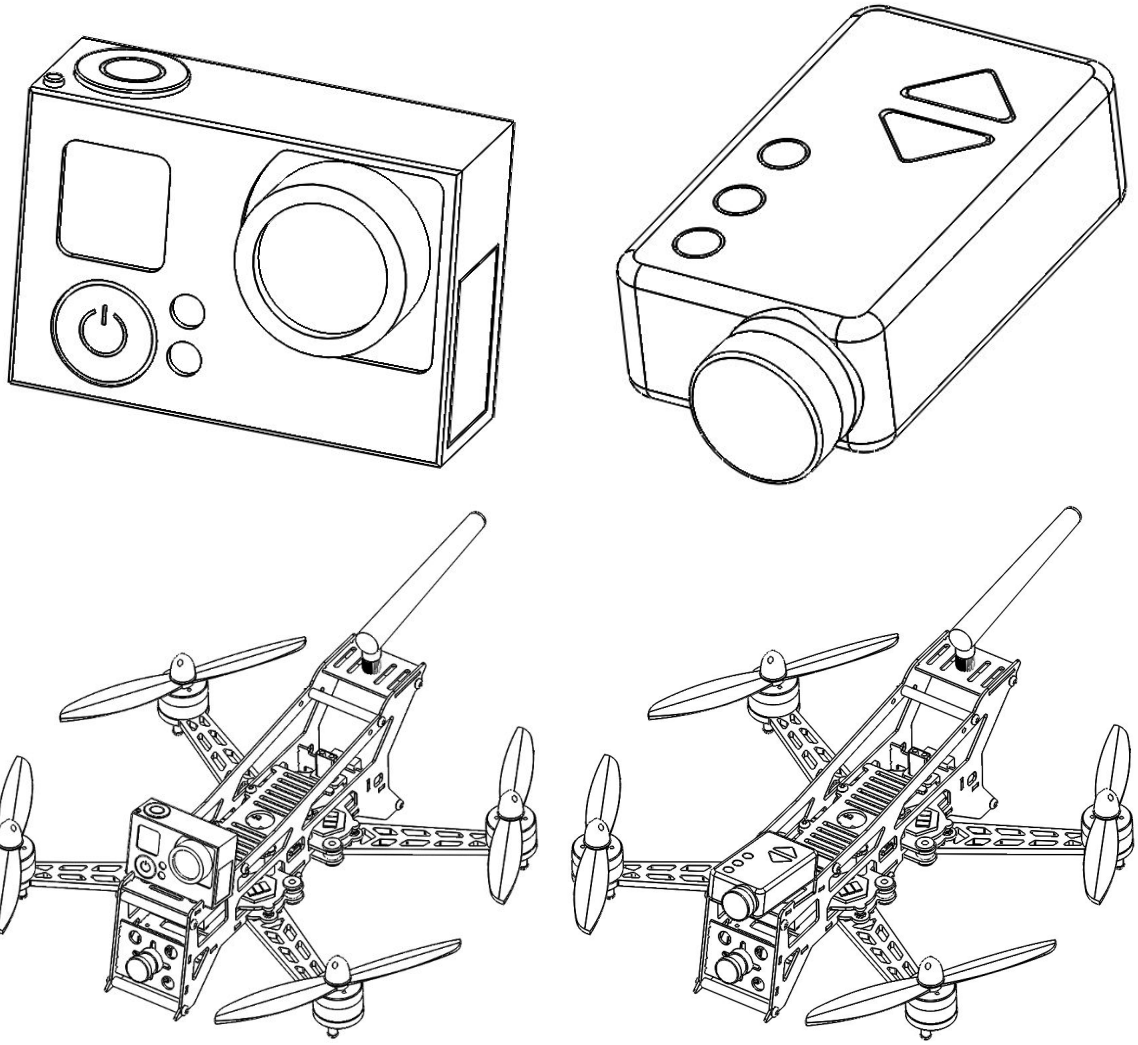
Size: 21*21*28mm±0.5mm

Operating Temperature: 0°C~45°C RH95% Max

Weight: 15g

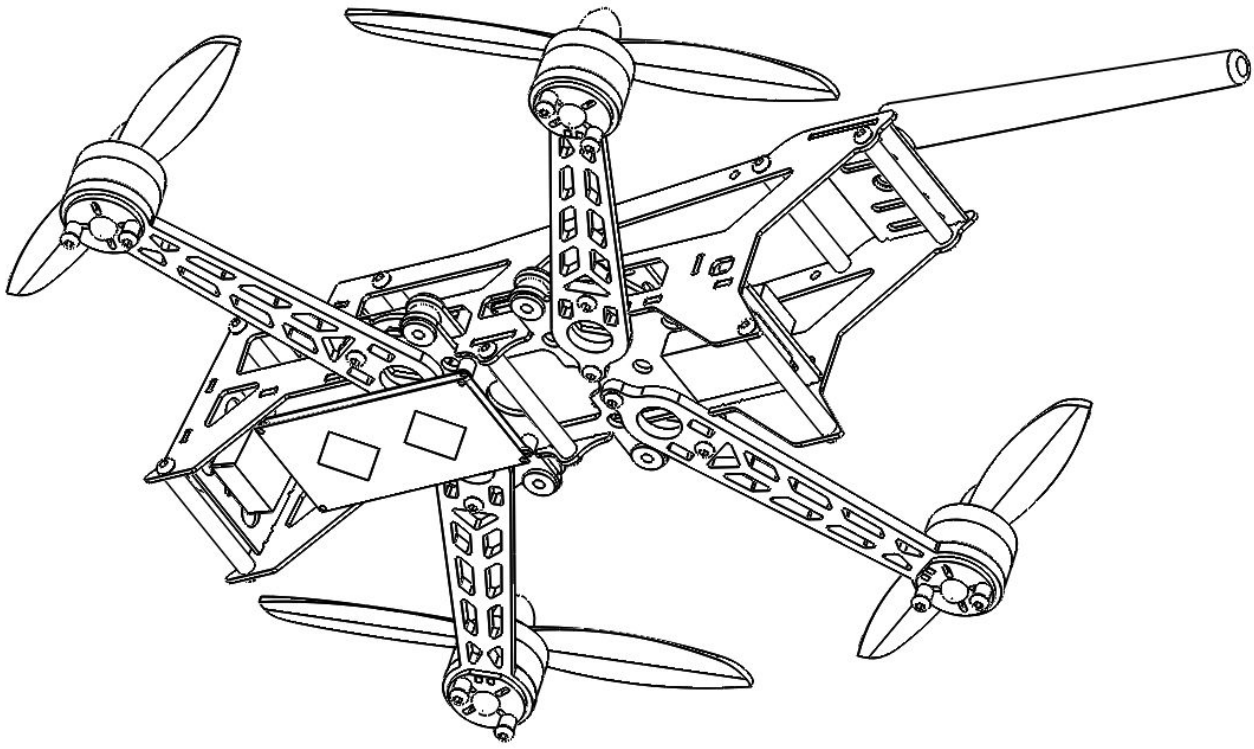
HD Camera (GoPro/Mobius)

HD Camera is optional accessory . There is special design on CMR280 allow you mounting HD action camera ,such as GoPro and Mobius .



Dual Antennas

Powerful video transmission system using 5.8G 32 Channel transmitter . Dual antennas on the tail and bottom to enhance polarization for a stronger signal.



OSD (On Screen Display)

The Welcome Screen

ARMED

DISARMED

Flight Status

Flight Data Statistics

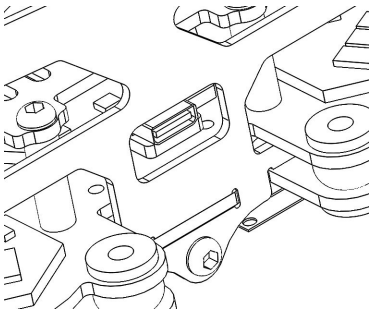
Optional 3D Goggles.

To get the ultimate FPV flying experience it is better to choose our 3D goggles. Its equipped with dual antennas, 32 frequency points for connection, and AV IN function.Inside with two displays ,adopt frequency hopping tech ,provide 3D flight feeling to the user . It also include a battery tray for NP-F330, NP-F530/F550/F570, NP-F730/F750/F770, NP-F930/F950/F960/F970. 18650 batteries to make it reliable.

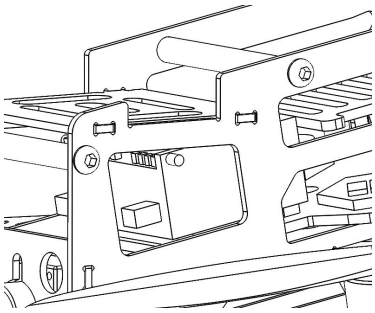
Connectors and Switches

1) USB Connector ,apply for configure the flight controller and upgrade the firmware.

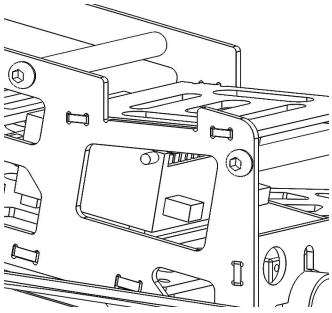
Note that to use the USB connector ,a battery must be connected also when you mapping the receiver , program motor parameter and etc .



2) OSD button, used to restart OSD



3) LED board button ,used to change video Tx frequency point ,and also to change video Tx band . Click the button to change frequency point . 4 second press and release to change video Tx band.

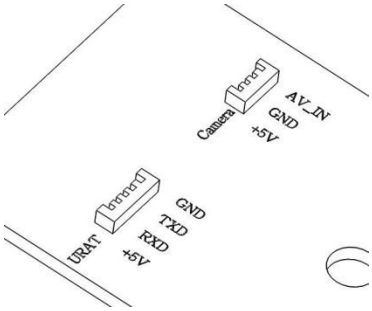


4) Socketed Video Tx Module .A 25mW-400mW 5.8GHz Custom RedPawzRF module , Use the jumper to switch transmission power between 25mW and 400mW.

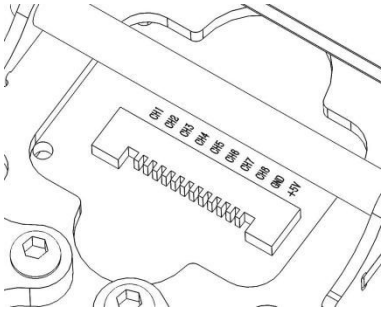
5) Flight Camera Video Power Connector & Reserved datalink interface.

The flight camera video connector is a 3 pin connector located bottom of PCBA. If you want to change the camera ,such as Gopro3/4 ,the pinout is as follow : 1. AV-IN 2. Gnd 3. +5V .

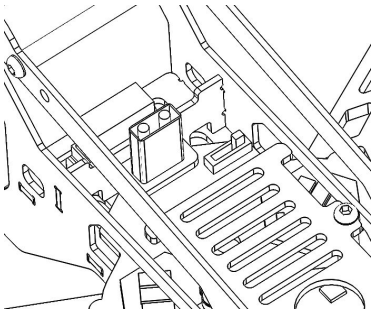
Reserved datalink interface is a 4 pin connector, the pinout is as follow:1.GND 2.TXD 3.RXD 4.+5V



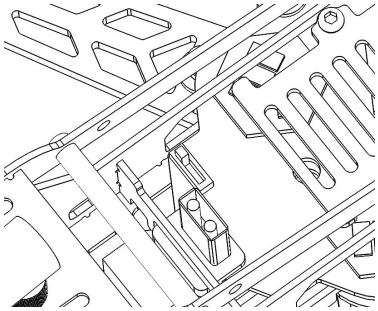
6) PPM/PWM Connector . If you choose PPM , please use configuration software to enable PPM input , PPM receiver :CH1 GND +5V . Disable PPM input ,it will be change to PWM receiver .



7) XT-60 Battery Connector and special protection . The pre-installed XT60 plug is compatible with most batteries . CMR280 have a special design ,if large forces are applied to the plug, it will not damage the circuit board.

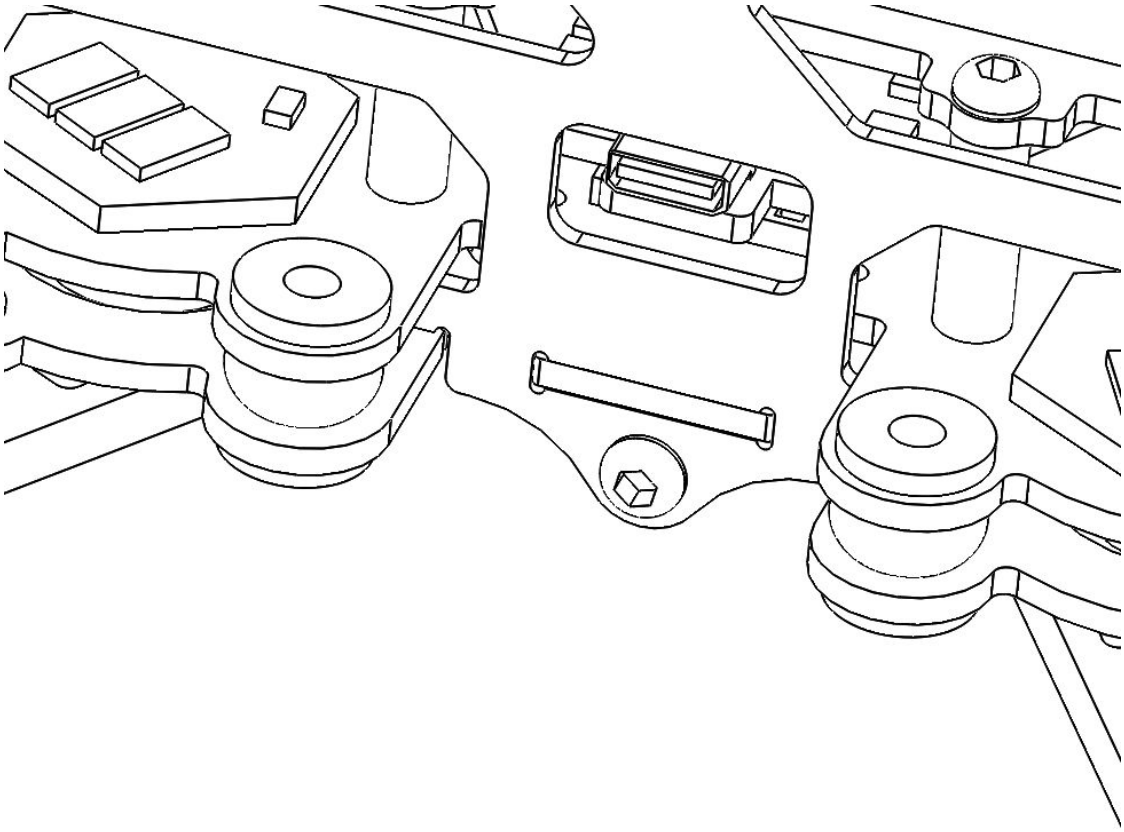


8) Navigation LED lights Switch. Two Red LED lights under each of front arms to indicate the head . Two Green LED lights under each of behind arms.



Anti-Vibrations Rubber Ball

The PCBA and the fuselage are shock isolated. This helps with shock absorption and can also protect the PCBA when the aircraft crash.



Specification:

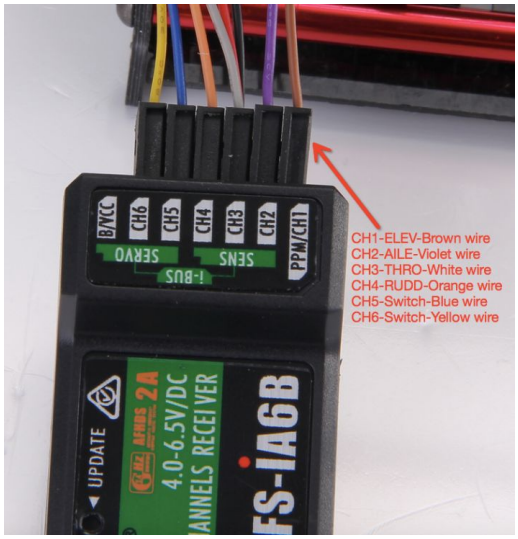
Key Characteristics	CMR280
Endurance	18mins hover / Highly dependent upon battery and flying style
Battery	Suggest 2200mAh 3S 25C
Weight And Measures	400g 280mm wheelbase
Basic Parameter	Operating Temperature : -10°C to +50°C (You have to keep the IMU warm if you want to use it under low temperature, could be -10°C or lower) Take-off Weight: 0.5KG~1 KG GPS Mode: No Max Tilt Angle: 180° Max Ascent /Descent Speed: ±20m/s Max Flight Velocity: 30m/s
Remote Control Parameter	Working Frequency: 2.4GHz ISM； Control Channels：8 Channels; Communication Distance :1000m；(maybe more)
FPV	Special design video glasses and video transmission OSD for FPV
Possibility of DIY	Modularity and removable design allow you make your own special multi-rotor

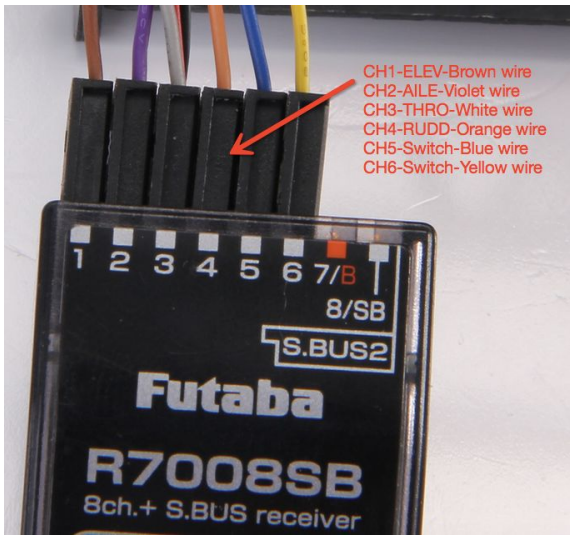
Channel Mapping and Arm FC

The RTF frame does not come with a RC transmitter or RX. Any 2.4 Transmitter/RX or even LRS will work.

Channel corresponding road map as follow :

Mode 1 :



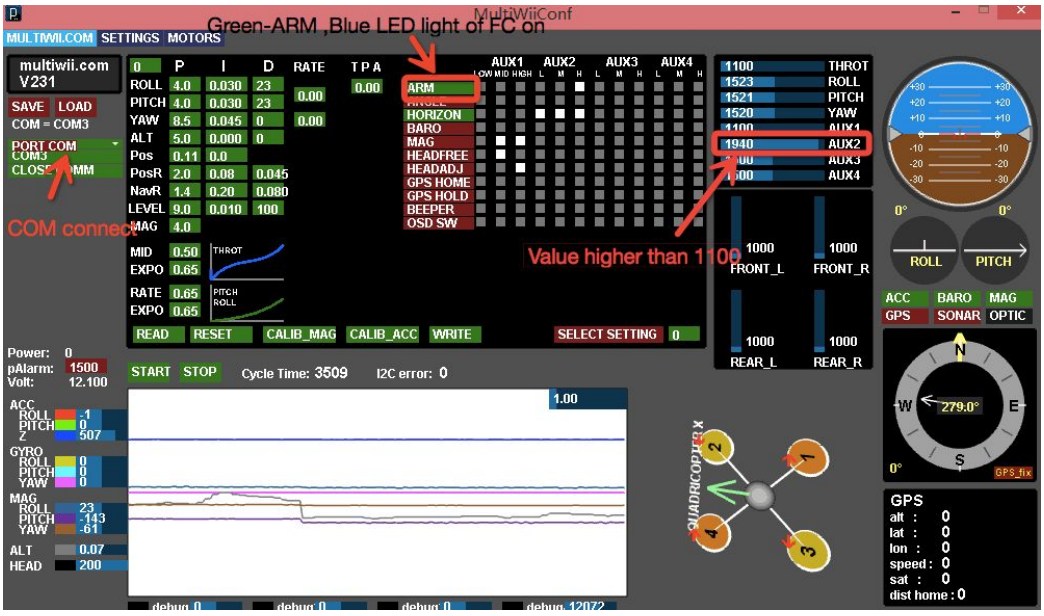


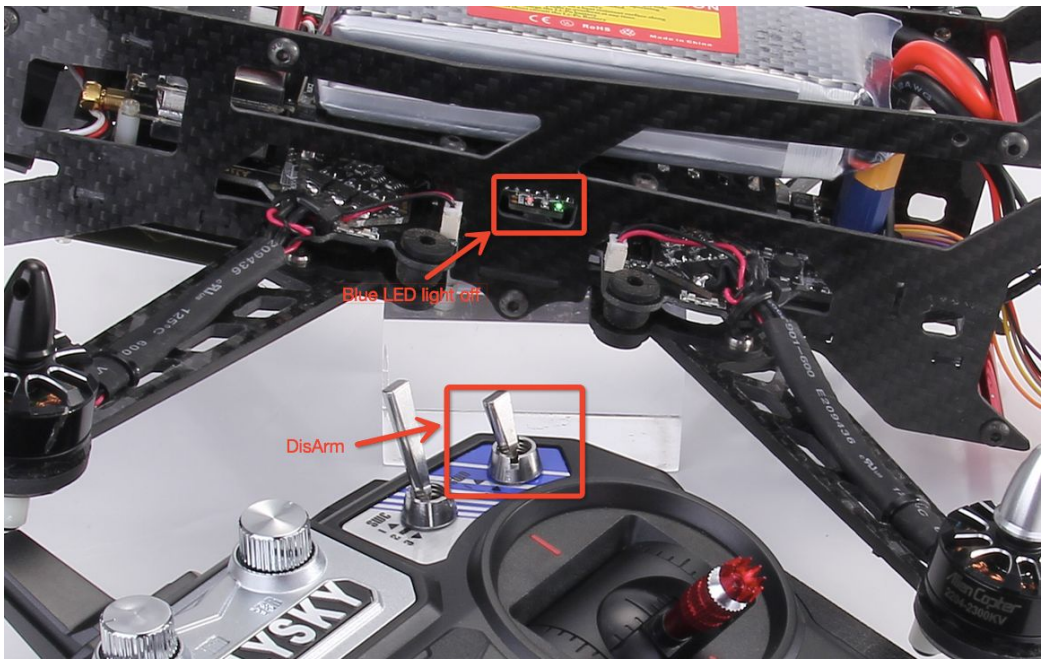
Mode 2/3/4 :

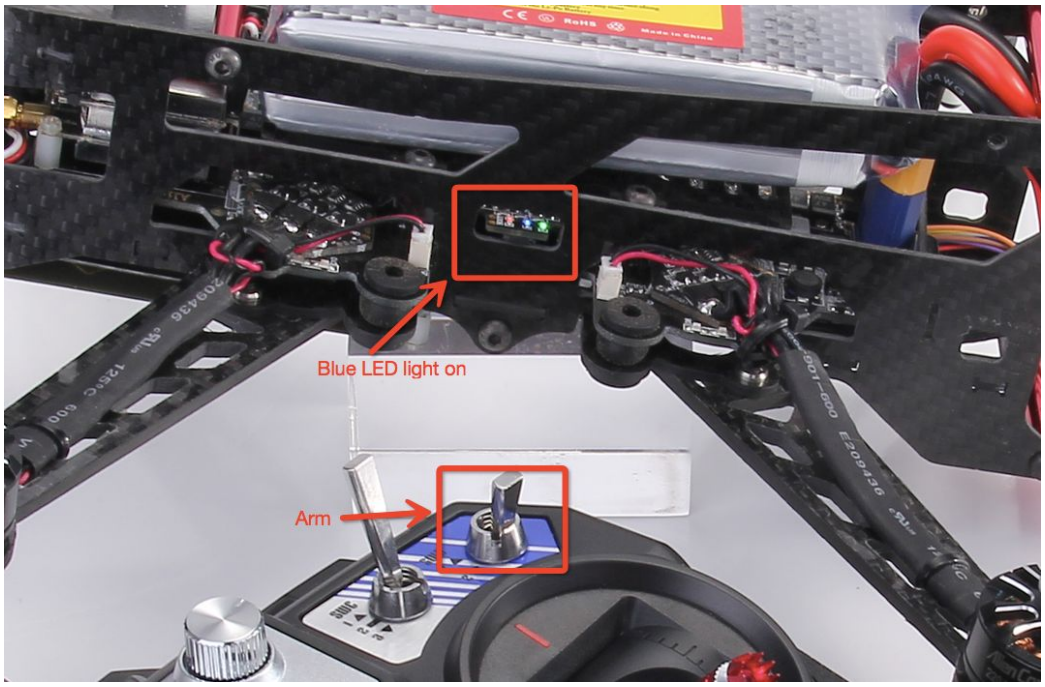
Brown wire - ELEV	Violet wire - AILE	White wire - THRO
Orange wire - RUDD	Blue wire - AUX1	Yellow wire - GEAR

Please attention : CH6-Switch-Yellow wire , should be corresponding with AUX2 in the software .

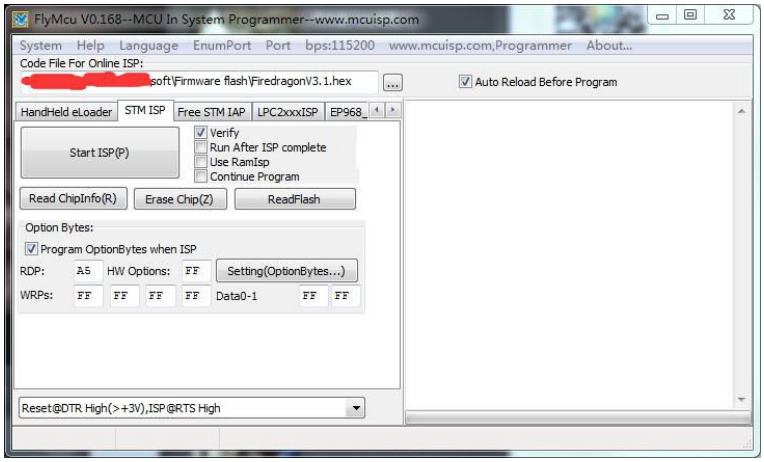
Please attention the value ,lower than 1100- disArm , higher than 1900-Arm.

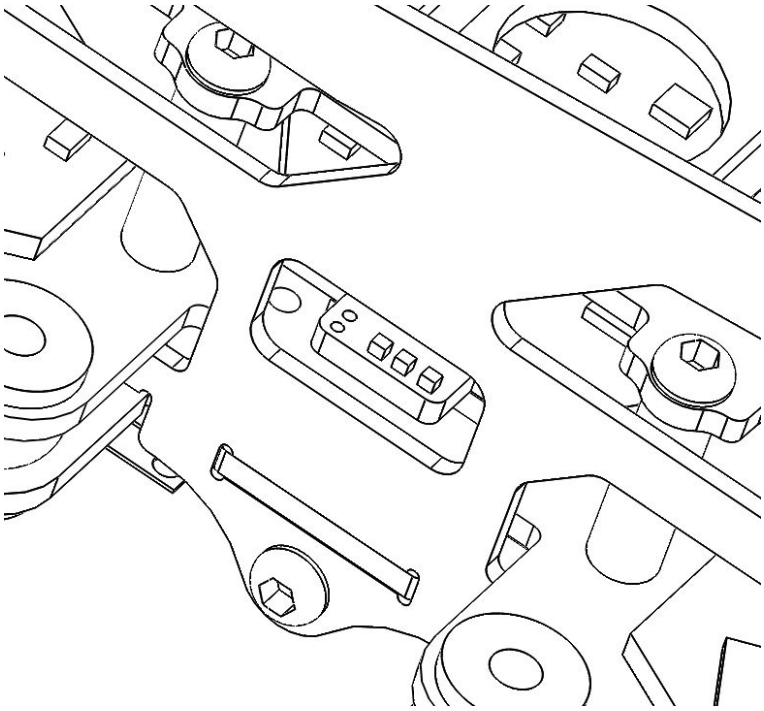



Blue LED light off
DisArm


Blue LED light on
Arm

Firmware Upgrades





Flying with competitors

If a few simple rules are followed, quad racing can be a lot of fun.

1) NEVER land near another pilot.

This is an absolutely golden rule. Landing your quad near another pilot, especially one who is at a significant distance, is like screaming in the ear of someone listening to a whisper at the other side of a room.

2) NEVER walk back to the pilot area with a powered-up quad

This is similar to 1), and is the most common cause of issues at the race track. When retrieving a model, unplug the battery before walking back to the pilot area.

3) POSITION the launch and landing zone

as far from the pilot area as possible his ensures that collisions at race start don’t affect other pilots.A distance of at least 10 meters is recommended, more than this is a bonus.

4) ALWAY Swarn in-air pilots before powering up a quad

Warn pilots, and be ready to power down IMMEDIATELY if a pilot is affected, and wait until he lands. Remember that it only takes a second or two, when flying race quads at speed, to crash and damage the quad, and whatever (whoever) it hits.

Looking after your CMR280

Snow and Water

Even though most of the PCBs in the CMR280 are coated with a conformal coating, which does offer some protection from water, it is not recommended to get the CMR280 wet, even if that water comes in the form of snow.

If your CMR280 does get wet, immediately remove power, and place it in a sealed container containing uncooked rice, for 24 hours. The rice will absorb some of the water.

If the CMR280 falls into salt water, damage may be more serious, and requires rinsing the quad with a bath of distilled water before placing it in the sealed rice container. The Tx module may not survive this ordeal, and may require replacing.

Note that even if the CMR280 survives a salt-water bath, long term corrosive effects of the salt on any exposed copper surfaces may result in the product failing at some point in the future.

The Sun

The camera use in the CMR280 (or any camera for that matter) does not appreciate being left staring at the sun for long periods of time.

LiPos also have a habit of living short lives when exposed to extreme heat. It is highly recommended to store the Vortex in the shade between flights.

Dirt

The typical mini-quad tends to live a life coated in a thick layer of grass, dirt, and other materials which happen to be in the way during landings, whether intentional, or otherwise.

It is highly recommended to keep the CMR280 clean of foreign materials, especially those which tend to conduct electricity when wet.

Support

First line of support is handled by the reseller. If you encounter any problems with your Red Pawz product please contact them first. they will replace or repair the product. Any user's modifications and disassembly, Red Pawz will not be liable .

If the reseller couldn't solve your problem , please leave message on www.redpawz.com , our staff will be reply you as soon as possible

Note

Manual will be update at anytime , electric manual on Red Pawz website shall prevail